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ABSTRACT

Completion of a four-month study of Oakland University's administrative systems needs is reported. It is recommended that the university undertake a major developmental effort to design and install new systems, with particular emphasis on payroll/personnel, general accounting, and student records. Following the development of these systems, a new alumni/development records system should be developed and additional work done in the physical plant records area. The university should move forward as soon as possible with the Preliminary System Design phase, and the installation work should begin in late 1976-77. Cost estimates are cited. Joint development efforts with other state colleges and universities should be pursued, both to reduce costs of development and to develop compatible systems for comparative data needs. Upgrading of the university's computing hardware should be considered during the Preliminary System Design phase. Over the next decade, the university could save approximately $3.8 million from development of the new administrative systems. (Author/LBH)

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UNIVERSITY ADMINISTRATIVE SYSTEMS

The Oakland University Long-Range Systems Planning Project Report December, 1975

U.S. DEPARTMENT OF HEALTH EDUCATION & WELFARE
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Preface

Oakland University is in the process of developing an advanced administrative information system that will take advantage of proven techniques in systems design and programming. It is planned to invite other four-year colleges and universities to participate in a joint systems development program. The advantages of combined effort should be apparent in the report that follows.

There has been enormous growth of computing hardware on most university campuses, much of it acquired for teaching and research purposes, rather than administrative applications. There has, however, been a gap between the development of hardware capabilities and administrative software development. While the hardware has been developed on an international scale, much of the software has been developed locally to fit particular needs. This pattern of development of administrative computer applications has typically created segmented systems for most universities, and the result has been problems of high cost, inefficiency, and incompatibility of systems and information both within and between institutions. This incompatibility has, in part, created the intense interest in developing better management information systems.

Much of the effort in the management information systems area has had a research theme to it and has focused on the problem of developing compatibility of information across institutions, primarily in the area of cost accounting. There have been significant developments, particularly by Western Interstate Commission on Higher Education (WICHE), in developing such things as program classification systems that will lead to more compatible data among institutions.

However, there has not been as much effort aimed toward developing comprehensive administrative data processing systems at the institutional level.* It is in this area that Oakland University and Arthur Andersen & Co. personnel have been engaged in a major study of the university's information needs. The result has been the development of specifications for the various administrative systems, with the necessary description of interfaces between the systems. It is the belief of the project team that these inter-related systems will provide the university with better management information which is more efficiently produced.

The design and installation of new administrative systems is a natural area for a cooperative venture by several universities. It is a "noncompetitive" area among institutions, it is a high-cost area where cooperation can reduce the costs, and there is a strong correlation between the internal management information needs of universities and the reporting demands of external agencies.

A joint development project would insure that the systems are designed in such a way that they would be exportable to institions not taking part in the initial project. At the same time, a joint development project would reduce the per-institution cost and cut the amount of time between the beginning of the project and conversion to the new systems.

Oakland plans to move forward with the design and installation phases of a new systems program as soon as possible, with particular emphasis on accounting/finance, payroll/personnel, and student records systems. It is estimated that the project will take three years.

The document that follows is the final report of the Oakland University Long-Range Systems Planning Project, and it includes the specifications for the administrative systems that are needed at Oakland and very likely at most four-year universities.

*This is not to say that there has not been significant developments at the state and institutional level. The Illinois Community College Board, for example, embarked on the development of a Management Information System in late 1974. The Illinois system is being developed as a central information system, but it also directly impacts on the various administrative systems that are employed by the community colleges in the system.

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Report Highlights

1. A four-month study of Oakland University's administrative systems needs has been completed, and it is recommended that the university undertake a major developmental effort to design and install new systems, with particular emphasis on payroll/personnel, general accounting, and student records. Following the development of these systems, a new alumni/development records system should be developed and additional work should be done in the physical plant records area.

2. The university should move forward as soon as possible with the Preliminary System Design phase, with the bulk of the work to be done during the 1976-77 fiscal year at an estimated cost of $170,000.

3. The installation work should begin in late 1976-77 and the bulk of the installation should occur during the 1977-79 fiscal years. The installation phase is estimated to cost $680,000.

4. Joint development efforts with other state colleges and universities should be pursued, both to reduce costs of development and to develop compatible systems for comparative data needs.

5. Upgrading of the university's computing hardware should be considered during the Preliminary System Design phase.

6. Over the next decade, the university could save approximately $3.8 million dollars from development of the new administrative systems.

Introduction

Background

The Long-Range Systems Planning Project resulted from the deliberations of the Computer Priority Council that was established during the 1974-75 fiscal year. Following a year of work by the council, it was determined that a major examination of the university's administrative systems and procedures was needed.

A few comments regarding the Computer Priority Council are appropriate to provide a basis for understanding why the Long-Range Systems Planning Project was undertaken. The council, composed of university top management, was established to monitor the activities of the computing center and to review and approve requests for program revisions and new systems development. The review and approval process was required because the computing center had grown rapidly over the past several years and there had been extensive demands for computer time, program changes, and new systems development on the part of user departments. The demands for services exceeded the computing center's capacity to respond to the requirements. Further, university management recognized that budgetary restraints supported the need to make the best possible use of the university's resources, both in the computing center and in user departments.

After functioning for a short period, the Computer Priority Council determined that the existing computer systems required a very high degree of programmer maintenance activity and that processing inefficiencies were occurring because of the manner by which the existing systems evolved. The high level of maintenance activity and the processing inefficiencies in administrative systems resulted from the rapid development from punch card

equipment, to an IBM 1620 computer, to the current IBM 360-40. As a result, existing systems are a combination of a variety of design approaches, programming languages, and documentation standards which are not necessarily appropriate for the present computer equipment. The high level of programmer maintenance activity and the operating inefficiencies occur in all of the existing mechanized business and administrative systems utilized by the university.

With these thoughts in mind, the Computer Priority Council decided to establish plans and priorities for corrective action, with particular emphasis on improved management information, cost-effectiveness, and system efficiency. However, the council members did not have enough information on which to base decisions for improving the university's systems and for more effectively utilizing the computer resources which are available to the university. To obtain the required information, the council decided to conduct a Long-Range Systems Planning Project with the following objectives:

1. Assess the status of existing business and administrative systems and procedures.
2. Develop specifications for each of the major business and administrative systems required by the university to meet its needs over the next decade.
3. Establish priorities for making required systems revisions.
4. Summarize the cost and benefits associated with making the required system revisions.
5. Develop a plan to design and install the systems revisions.

As a result, a project team of university staff and Arthur Andersen & Co. personnel was appointed in July, 1975, to undertake the Long-Range Systems Planning Project.

The project team was under the direction of Donald O'Dowd, President of Oakland University, and Robert Wilson, a partner of Arthur Andersen & Co. Co-project leaders were Peter Van Hull of Arthur Andersen & Co. and William Connellan, assistant to the President and director of public relations at Oakland University. Other university staff assigned to the project were Paul Farr, manager of the Information Center in the computing center, and John Lydic, assistant controller. Deborah Worzniak of Arthur Andersen & Co. was assigned full-time to the project. William Evenden and Arnold Van Zanten, both of Arthur Andersen & Co., participated in the project on a part-time basis.

Work Completed

The project team divided the work into three major phases: information gathering, developing specifications for new systems, and examining the costs and benefits of developing the new systems.

The first phase included a survey of key offices regarding personnel time allocation, reports generated and received, and information flow concerns. To complete this work, the project team interviewed more than 50 key university personnel, including all the executive officers, deans, and staff people whose responsibilities are related to the flow of management information on campus. In cooperation with the computing center staff, the project team also examined computing center operations as part of this phase.

Based on the information gathered in the first phase, the project team focused its attention on five major areas of future systems requirements:

1. Accounting and Budgeting
2. Payroll/Personnel
3. Student Records
4. Alumni/Development Records
5. Physical Plant Records

Specifications were developed for each of these areas. The specifications are included in the appendices to this report. The university's long-range goals and objectives were the focal point for development of the specifications. The specifications describe systems that would assist the university in fulfilling these goals. The systems specifications have been reviewed and approved by the senior executive officers of the university. In addition, the specifications have been used as check lists to determine which systems required modifications or redevelopment. The check list results are included in the respective parts of the appendices.

The third phase of the project was directed toward projecting the costs and benefits of the system revision and redevelopment effort. The results of that work are summarized later in this report.

Completion of these three major phases of the project provided the basis for the university to develop plans and assign priorities for developing improved administrative and management systems.

Conclusions

The following conclusions and plans have resulted from the project.

1. The university has decided to undertake a comprehensive administrative systems redesign and development project. The following systems are to be included in the project:

   a. Accounting and Budgeting
   b. Payroll/Personnel
   c. Student Records
   d. Alumni/Development Records
   e. Physical Plant Records

These revisions are cost-justified in economic terms and the university's management information needs would be much better met with the redesigned systems. The university would reap substantial economic benefits from the new systems, with net savings projected to be three million dollars over the next decade. Further, improved management information could lead to improved planning and control of operations because administrative personnel would be able to direct their energies to operating concerns rather than spending time on work connected with ineffective systems.

2. The Preliminary Systems Design phase for the payroll/personnel, accounting and budgeting, and the student records systems should begin immediately, with most of the work to be completed during the 1976-77 fiscal year at an estimated cost of $170,000. As a part of this phase the feasibility of using and adapting existing software would be evaluated. The results of this evaluation would impact the estimated installation costs. A program revision request has been submitted to the state to cover this expenditure. The payroll/personnel, accounting and budgeting, and the student records systems are targeted for redesign and redevelopment prior to the other systems because these systems have the greatest impact on university operations.

3. The installation of the systems specified in point 2 should be completed by the 1978-79 fiscal year, with a preliminary estimated cost of $680,000. This cost has been estimated assuming that existing government accounting and budgeting software could be adapted and that the student records and payroll/personnel systems would largely be custom designs.

4. The alumni/development records system should be the fourth system to be developed. The university should explore during the preliminary systems

design phase the possibility of utilizing existing software to reduce the cost of implementing the alumni/development records system. The physical plant systems should be designed and installed subsequent to the alumni system. Both projects should follow as soon as the three major systems are designed and installed.

5. The university should consider the possibility of upgrading its computer hardware as part of the preliminary systems design phase.

6. The university should explore joint development of the new systems with other state colleges and universities.

Systems Overview

Specifications were developed for the following systems and subsystems during the Long-Range Systems Planning Project:

1. Accounting and Budgeting
2. Payroll/Personnel
3. Student Records
   a. Admissions
   b. Registration and Student Records
   c. Student Accounting
4. Alumni/Development Records
5. Physical Plant Records
   a. Work Orders
   b. Fixed Assets
   c. Space Utilization
   d. Stores Inventory

The specifications include the following information for each system and are intended to provide a basis for organizing project teams to complete the systems design and installation work:

1. Descriptions of required systems processing features.
2. Summaries of required interfaces with other systems.
3. Lists of key reports and brief descriptions of the purpose and use of each report, including identification of key management information.
4. Lists of key files and brief descriptions of the purpose and use of each file.

5. Transaction processing volume projections over the next five years.

6. Recommendations regarding systems revisions.

7. Reasons why revisions are required.

8. Check lists which compare current system processing features against features summarized in the specifications.

The following paragraphs highlight the content of the systems specifications. In addition, the narrative describes how the systems, when integrated, provide university management with an effective management information system.

Accounting and Budgeting

In order to respond creatively to fiscal constraints and changing enrollment pressures, the university must continually improve planning and control procedures and streamline, where possible, its business and administrative procedures. The accounting and budgeting system is a focal point for this effort.

The specifications are structured to provide the majority of the reports required by the university for sound fiscal management. This includes not only the traditional top level financial statements such as Balance Sheets and Statements of Changes in Fund Balances, but also a full series of responsibility reports tailored to the organization of the university and a series of reports along program lines. The specifications also include purchasing, encumbrance, and accounts payable subsystems.

Extensive budget preparation and review procedures are provided for, eliminating much of the clerical effort which is currently required to prepare and revise budgets as the university moves through the steps of the budget preparation cycle. Eliminating the clerical effort should allow university management and budgeting personnel to concentrate their efforts on planning operations.

Payroll/Personnel

Since personnel costs account for the most significant portion of the university's operating cost, it follows that the payroll/personnel system is one of the key processing systems. The specifications of the payroll/personnel system provide for processing of payrolls and payroll-related data including distribution of payroll costs to cost centers.

The system is totally integrated with the accounting and budgeting system. For example, the specifications provide for maintaining position control data which are used in conjunction with the accounting and budgeting system for monitoring and controlling payroll costs.

Personnel data as well as payroll data are specified to be maintained by the system. The personnel data include biographical information and other information required to prepare reports which are required by various governmental agencies. Available sick leave and vacation would also be maintained by the system.

Presently the payroll and personnel systems are independent systems maintained by separate university departments resulting in some duplication of effort. Integration of the payroll and personnel systems could increase efficiency while maintaining internal control through separate organizational units which input data to the system.

Student Records

The student records system specifications provide for maintenance of data on students from the initial point of contact in the admissions process through a student's career at the university. This includes processing of student applications and procedures for following-up with and admitting students. Further, students are processed through registration and both academic and

financial records are maintained for each student. The financial portion of the system includes billing and accounts receivable processing, as well as procedures for processing financial aid students. The specifications provide for accommodating undergraduate, graduate, and continuing education students.

One unique aspect of the specifications is that a degree audit module is provided for in the system. The degree audit system provides for monitoring each student's progress toward a degree and for identifying potential graduates and confirming that they have satisfied degree requirements for their particular program. The intent of this part of the system is to provide for improved student advising services.

Alumni/Development Records

This system provides for maintenance of key alumni and nonalumni donor data. The main functions of the alumni/development records system are to provide a basis for obtaining gift funds from individuals, corporations, and foundations, and to maintain biographical data on alumni for research purposes. The specifications provide for the ability to plan and monitor campaign progress.

The present alumni and development records are independent systems and are primarily manual. As the university matures, the alumni/development record-keeping procedures must accommodate processing of large volumes of records. Currently there are approximately 10,000 alumni and 1,000 alumni donors. However, it is projected that by 1985 there will be 30,000 alumni and 7,500 donors. This is a dramatic change in the processing volumes.

Physical Plant

Acquisition and maintenance of property and supplies is another significant cost factor in the university's operations. These specifications define

the record-keeping procedures for stores inventory, monitoring space utilization, and for physical control over fixed assets.

Physical control over fixed assets includes maintaining records of key data such as tag number, location, and property descriptions as well as taking periodic physical inventories to verify that the property is still in use. These records provide a basis for making purchasing decisions on property acquisitions.

Control over maintenance costs is provided for through the use of a work order system. The work order specifications accommodate planning and reporting of work order labor and material costs. In addition, procedures for monitoring work backlogs and service levels are included in the specifications.

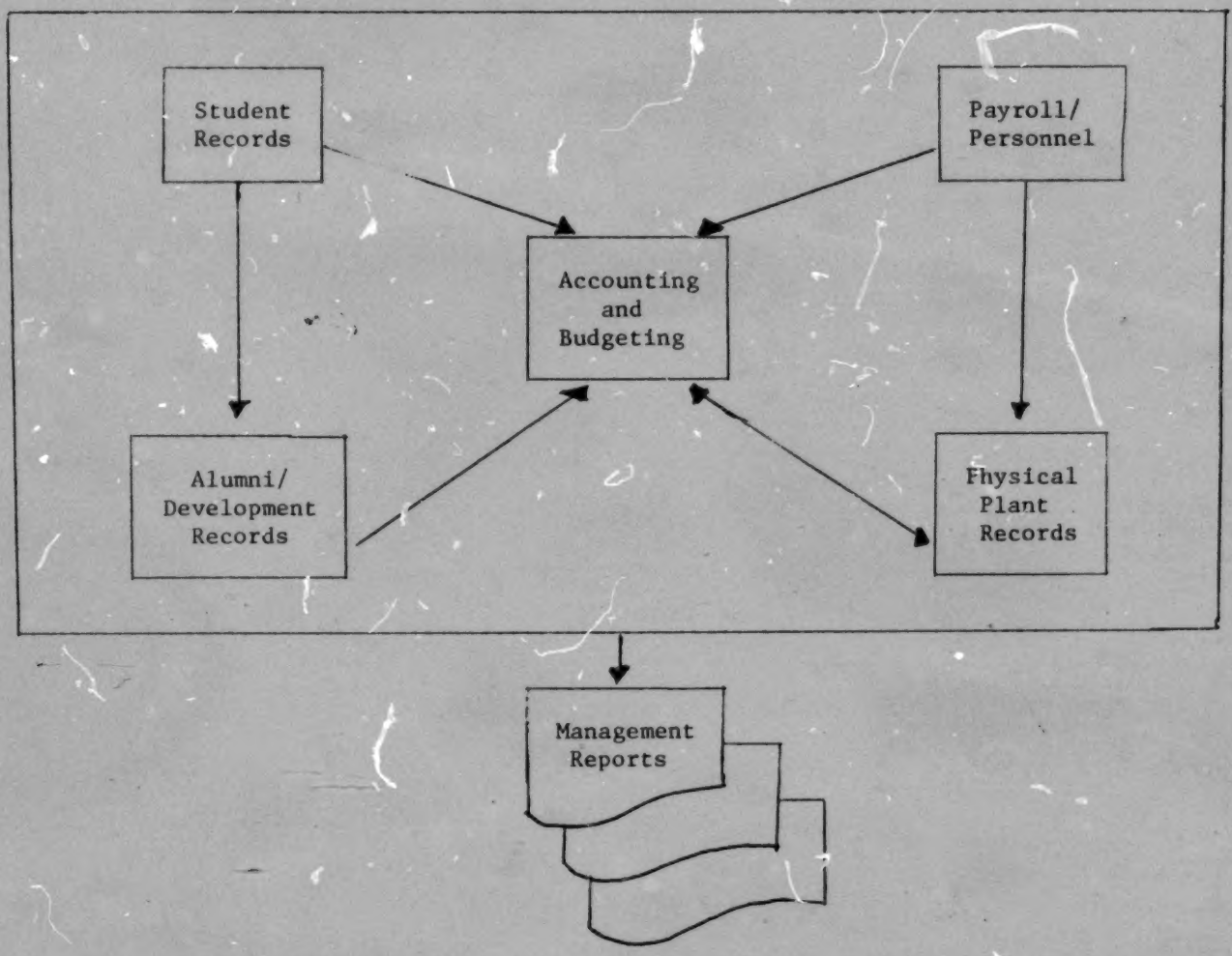
Management Information

A review of the report descriptions in the systems specifications will indicate that the systems, when integrated, form a management information system. Both financial and operating reports are provided for management use, with many of the reports providing comparisons of actual versus planned results along both functional and program lines. Further, the reports have been specified to fulfill the cost study requirements of the state of Michigan. The schematic diagram on page 13 is a representation of the management information system.

It should also be noted that flexibility is stressed in the specifications of all the systems, so that the university can respond quickly to changing requirements for providing data to both internal and external sources.

Oakland University

Management Information System Schematic



Design and Installation Approach

The schematic diagram on page 15 graphically displays the phases and major tasks that are to be undertaken in order to complete the systems design and installation project. These steps are required for the successful completion of the project.

Preliminary Systems Design

The preliminary systems design phase is to be undertaken for the accounting and budgeting, payroll/personnel, and student records systems, and will include five major segments:

1. System design
2. Equipment evaluation, as required
3. Installation schedule
4. Economic (other) evaluation
5. Review and approval

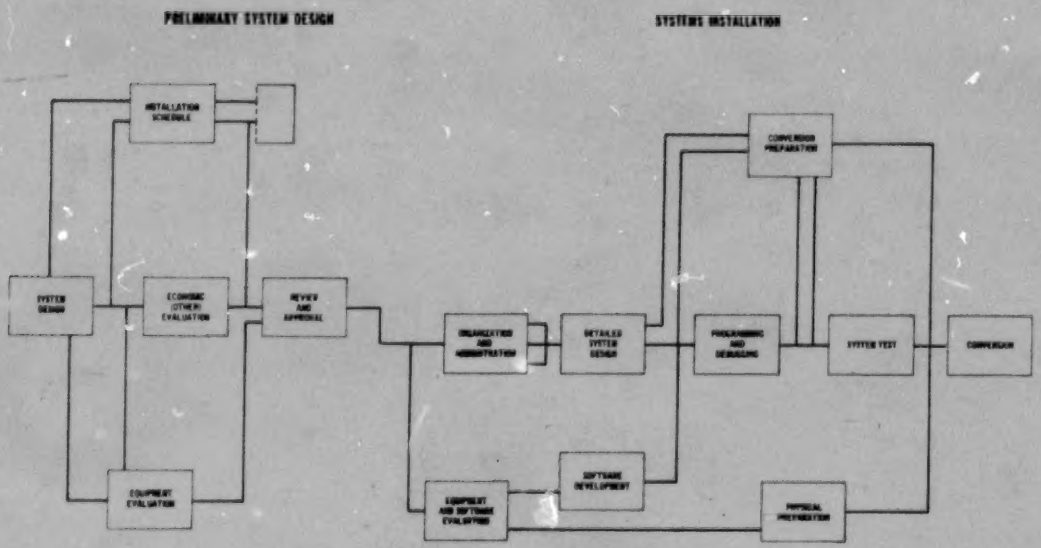
These five segments are necessary to fully define the systems and to provide a basis for preparing detailed installation work programs and cost estimates.

Systems Installation

This phase of the project includes all the steps involved between the final approval of the installation project through the cut-over to the new systems. The schematic diagram specifies the nine major tasks required to complete the project.

1. Organization of the installation project
2. Detailed system design

Overall Approach



3. Programming and debugging
4. Conversion preparation
5. Equipment and software evaluation
6. Software development
7. Physical site preparation
8. Systems test
9. Conversion

These steps provide for effective project supervision and for effective communication with management and others regarding project status and progress.

Preliminary Cost Estimates

Approximately six person years of effort are estimated to be required to complete the preliminary systems design phase of the project. This work would be undertaken by a project team consisting of university and Arthur Andersen & Co. personnel and the total costs are projected at $170,000. While it is not possible to estimate accurately systems installation costs without completing the preliminary systems design phase, rough "rules of thumb" can be used to develop estimates. Typically, the installation phase requires three to four times the effort required during the preliminary systems design phase. Since it is assumed that the systems design will provide for both batch and on-line processing, a factor of four times the preliminary systems design costs has been used to project the systems installation costs. Therefore, the systems installation costs are estimated at $680,000 and the total project cost is estimated at $870,000, including an investment of $20,000 in the Long-Range Systems Planning Project. This cost has been estimated assuming that existing government accounting and budgeting software could be adapted and that the student records and payroll/personnel systems would be largely custom designs.

Hardware

Part of the effort during the Long-Range Systems Planning Project was directed at assessing the upper and lower limits of computer hardware configurations required to process the university's administrative applications. Academic processing requirements were not included in computer hardware configuration evaluation.

The university's existing computer hardware consists of a Burroughs B-5500 computer for academic use and an IBM 360-40 for administrative use. These two computers are between five and ten years old and are, for all practical purposes, fully utilized considering the existing computer systems and programs.

However, a high spot review of the IBM 360-40 operations indicated the capacity could possibly be increased by adding additional tape and disk drives. A detailed review of the jobs being processed, the schedule for those jobs, and the peripheral equipment requirements for each job would have to be completed to verify this preliminary conclusion.

It is anticipated that some upgrading of hardware will be necessary to install the new applications and to accommodate future processing needs, such as on-line requirements. In order to determine the hardware needs, the future systems must be designed to identify output, file, and processing requirements. This design is the next step which is to be undertaken by the university.

During the process of exploring joint development of the new systems with other state colleges and universities, it was determined that most of the schools which are likely candidates for a joint project use IBM 370 equipment to process their administrative work. If the joint development effort materializes, Oakland University would have to consider upgrading hardware to provide for compatibility with the other participating colleges and universities.

Preliminary cost projections indicate that the additional costs required to upgrade the computer hardware could possibly be offset by eliminating costs presented in the cost benefit section. New systems would have to be designed and implemented in order to realize the savings.

Cost/Benefit Analysis

The expenditure of $870,000 by Oakland University to revise its systems has a number of benefits in terms of better management information, operations control, and planning, but an expenditure of that magnitude must also contain an economic return to the university to justify the investment. There are several ways to calculate the return to the university, and the project team worked through a number of approaches to the cost savings question. The simplest--and most conservative--projection is that the redesigned systems will reduce the amount of time devoted to maintenance of the existing data processing systems and programs. Moving from the current maintenance pattern to a more standard level of maintenance could save 5.58 positions in the computer center. The savings that would accumulate from this change alone would provide a break-even on the investment by the eighth year, as shown in Table 1 on page 20.

Table I assumes that there are no other efficiencies or savings to be achieved through the development of new systems for the university. A more realistic assumption is that the new systems would have a major impact on both the computing center and user departments. Thus, the project team completed the cost/benefit analysis based on this assumption. In order to calculate the potential savings in the user areas, the project team examined staffing patterns within the university over the past five years, studied the current time allocations of staff, and projected growth patterns in staff over the next decade.

Two items emerge very clearly when the growth in staff over the past five years is examined. The first is that growth in Administrative-Professional and Clerical-Technical staffing levels has lagged behind the growth in the university's enrollment, as shown in Table II on page 21.

Table I

Computer Center Cost Savings

Year	Costs	Savings
1975-76	$ 20,000	
1976-77	200,000	
1977-78	325,000	
1978-79	325,000	$ 132,000
1979-80		139,000
1980-81		146,000
1981-82		153,000
1982-83		162,000
1983-84		173,000*
1984-85		184,000
1985-86		194,000
	$870,000	$1,283,000

*break-even year

Note: The savings in the table are based on current computer center compensation costs, a 6% inflation rate, and 20% associated personnel costs (travel, telephone, equipment, etc.)

Table II

Total General Fund Support Staff for Oakland University (1970-71 through 1974-75)*

Year	A-P's	% Growth	C-T's	% Growth	FYES	% Growth	Headcount	% Growth
1970-71	116.5	N/A	182.5	N/A	6,643	N/A	7,006	N/A
1971-72	129.5	11.2	187.0	2.5	6,981	5.1	7,069	.9
1972-73	140.0	8.1	182.5	(2.4)	7,403	6.0	8,169	15.6
1973-74	135.5	(3.2)	186.0	1.9	8,241	11.3	9,638	18.0
1974-75	141.5	4.4	199.5	7.3	8,537	3.6	10,216	6.0
Total Five-Year Percentage Growth		21.5		9.3		28.5		45.8

*These data are based on the authorized positions as recorded in the budget books, but do not include members of the executive group who hold A-P rank, nor administrative personnel who hold academic rank. The data were controlled to reflect the changing status of various groups. For example, librarians and athletic staff held A-P rank in 1970-71, but faculty rank in 1974-75. In all cases, personnel were categorized for all years by the rank that they held as a group in 1974-75.

While FYES production has increased 29 percent and headcount 46 percent in this period, the growth in Administrative-Professional and Clerical-Technical staff has been 22 and 9 percent respectively. When the 1975-76 final figures are available, the differences will be even sharper. The university has experienced some continued enrollment growth, while the number of staff positions has been reduced by the state's fiscal situation.

The second point is that the bulk of the staff growth that has taken place during this period has been in offices that are heavily involved in the major administrative systems areas (student records, business office, personnel, and computing center). The systems-related areas of the university have accounted for 71 percent of the A-P staff growth and 39 percent of the growth in clerical staff. Because of the differences in the initial staffing base, the rate of growth in these administrative systems areas has been almost twice that of the rest of the university. Table III on page 23 reflects the staff growth by system and office.

Predicting future staffing patterns is not an easy task, particularly considering the uneven pattern of the past five years and the reduction in staff this year. A most conservative method for projecting staffing patterns is to estimate the student/staff ratio in 1979-80, based on a projection of current patterns and an estimated enrollment growth rate of three percent per year during that time. The student/staff ratio projections are shown in Figures 1 and 2 on pages 24 and 25. The 1979-80 staff levels that would result from this projection are consistently less than the 1974-75 staffing patterns (projecting the headcount/staff ratio would produce 121 A-P and 153 C-T general fund positions). However, it is not realistic to assume that the projected staffing levels could function effectively with the current business and administrative systems and procedures.

Table III

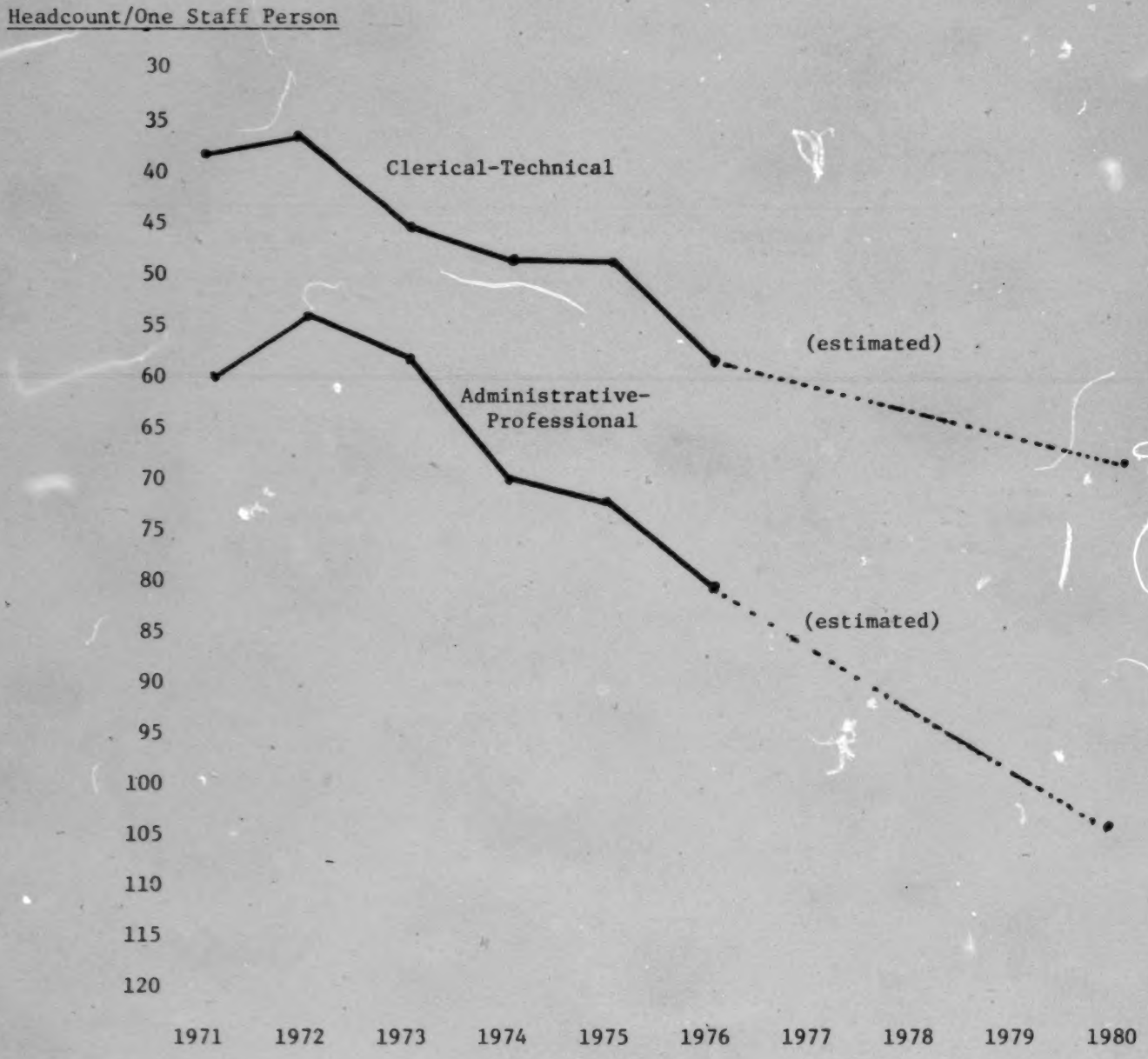
General Fund Staff Growth in Systems Areas

System	Office	1970-71 Staff			1974-75 Staff			Growth			Percentage Growth		
		CT	AP	Total	CT	AP	Total	CT	AP	Total	CT	AP	Total
Student Records	Student Services	12	8	20	8	7.5	15.5	(4)	(.5)	(4.5)	(33)	(7)	(23)
	Academic Student Services[1]	14	13	27	22	16	38	8	3	11	57	23	41
Accounting	Business Affairs[2]	27	12	39	26	20	46	(1)	8	7	(4)	67	18
Payroll/ Personnel	Employment Relations[3]	3	3	6	5	6	11	2	3	5	67	100	83
	Computing Center	13	15	28	13	18	31	0	3	3	0	20	11
Total--Major Systems Areas		69	51	120	74	67.5	141.5	5	16.5	21.5	7	32	18
Total--All Other Offices		113.5	65.5	179	125.5	74	199.5	12	8.5	20.5	11	13	11
Total--All Staff		182.5	116.5	299	199.5	141.5	341	17	25	42	8	21	14

[1]admissions, financial aid, registrar
[2]includes all of the business affairs division except employment relations and the computing center
[3]the payroll staff is not included here, but in the business office totals

Figure 1

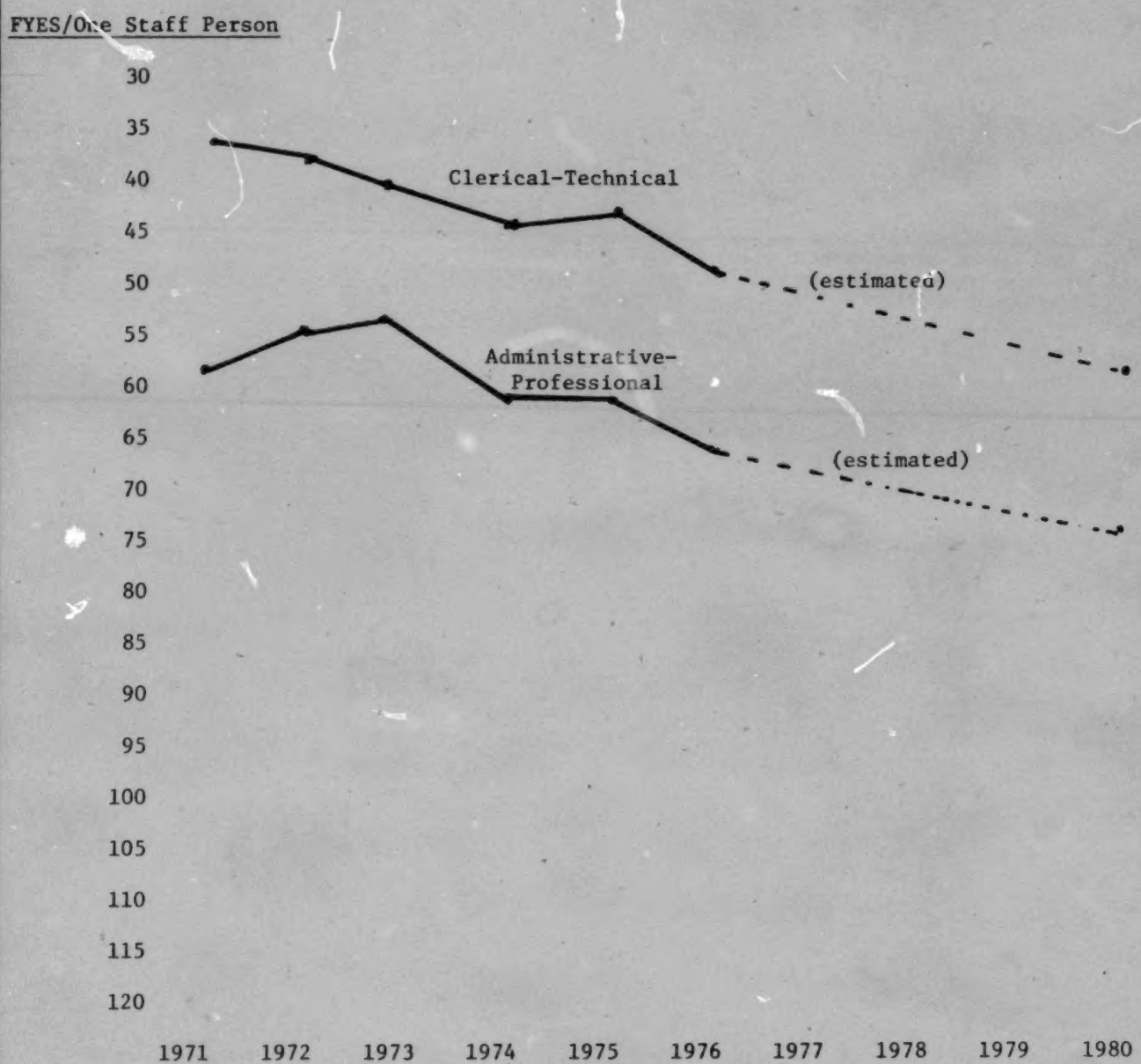
Ratio of Student Headcount to Staff*



*Fall headcount to general fund full-time equivalent positions

Figure 2

Ratio of FYES to Staff



A more realistic method for projecting staffing patterns is to hold the 1974-75 student/staff ratios constant through 1979-80 and assume the three percent growth rate in enrollment. This projection would produce 23 new administrative-professional positions and 32 new clerical-technical positions. If the university continues with its present systems, and hiring patterns follow those of the past five years, the systems-related offices would be awarded 16 of the 30 A-P positions and 12 of the new C-T positions.

Based on an analysis of the specifications of the required new systems, an examination of the time allocation study that was completed in connection with the Long-Range Systems Planning Project, and a review of current staffing patterns, the project team believes that implementing the new systems could (conservatively) cut the staffing growth rates in these areas in half, or a savings of 8 A-P positions, and 6 C-T positions. Table IV on page 27 portrays the costs and economic benefits to the university of implementing the new systems considering the projected saving in both the computer center and user departments. For the purposes of this table, 1976-77 and 1977-78 were held constant and the growth in staff and the respective savings were projected to begin in 1978-79. It should be noted that the project team used conservative figures in projecting the savings because of the uncertainty of predicting future patterns.

Table IV indicates that the university could pay for its new systems development by 1980-81 and that the net savings over the decade would be approximately three million dollars.

As noted earlier, the project team believes that it would be beneficial to explore a joint development project with other state colleges and univer-

Table IV

Summary Cost/Benefit Analysis

Year	Costs	Computer Center Savings	Growth Savings[1]	Total Savings
1975-76	$ 20,000			
1976-77	200,000			
1977-78	325,000			
1978-79	325,000	$ 132,000	$ 85,000	$ 217,000
1979-80		139,000	164,000	303,000
1980-81		146,000	253,000	399,000[2]
1981-82		153,000	319,000	472,000
1982-83		162,000	391,000	553,000
1983-84		173,000	415,000	588,000
1984-85		184,000	439,000	623,000
1985-86		194,000	466,000	660,000
Total	$870,000	$1,283,000	$2,532,000	$3,815,000

[1]Two assumptions: 6% compensation inflation rate, extrapolated from average A-P and C-T salary rates as of April, 1975. A 20% figure was also added to reflect associated costs with personnel (telephone, travel, etc.). There will be no growth in enrollment or staff after 1982.

[2]Break-even year.

sities. Joint development would not only bring substantial benefit to the institutions in terms of comparable data, but it would also reduce the costs to each institution. The cost of developing and installing new accounting, payroll/personnel, and student records systems are estimated on a preliminary basis in Table V. A cooperative venture with two other schools would move the break-even year forward one year to 1979-80, or a one-year pay-off for the development.

A word of caution is necessary in working with the various cost figures and the benefit figures. All of the cost figures are based on preliminary estimates. While the preliminary systems design phase for Oakland University can be figured fairly carefully, the installation phase figures are based on a "rule of thumb" that installation costs three to four times the design totals. In keeping with the cautiousness in this analysis, the more costly expenditure figure was used.

Table V

Estimated Joint Development Costs and Benefits

	Cost Per School			Total for Three Schools
	One School	Two Schools	Three Schools	
Preliminary System Design	$170,000	$123,000	$100,000	$ 300,000
Installation	680,000	492,000	400,000	1,200,000
	$850,000	$615,000	$500,000	$ 1,500,000[1]
Potential Total Savings				$11,500,000[2]
Potential Net Savings				$10,000,000

[1]All cost figures are preliminary estimates and are based on rough "rules of thumb." Detailed installation cost estimates can be prepared once the preliminary systems design work has been completed.

[2]Potential savings for three institutions are projected at three times the potential savings projected for Oakland University.

University Administrative Systems

Accounting and Budgeting

System Features

Organization/Program Reporting

1. Provide for budget summary reports to persons responsible for each organizational unit which:

   a. Summarize actual vs. budget amounts and variances on a current month and year-to-date basis.

   b. Summarize encumbered and available balance amounts with respect to annual budget amounts.

2. Provide for program reports which reflect the same data as organizational reports, but along different reporting lines.

3. Provide for holding responsible individuals accountable for variances depicted on the reports.

4. Provide for accumulating and reporting of performance measure and cost study/analysis data such as:

   a. Head counts and fiscal-year-equivalent students.

   b. FTE employees.

   c. Costs and student credit hours by course level and discipline.

   d. Ratio of instruction salaries to student credit hours.

   e. Ratio of administrative personnel to faculty personnel.

   f. Ratio of research positions to instructional positions.

   g. Counselling and guidance costs per contact.

   h. Admissions costs per application.

   i. Maintenance costs per square foot.

   j. Other.

5. Provide for a roll-up and summary reporting of the accounting and budget data to supply top management with effective and easy-to-use information.

6. Provide for the capability to report and analyze revenue and expenditure amounts by object code.

7. Provide for changes in organization/program structures and responsibilities.

8. Provide for projecting overdrafts based on rates of spending and for tightly controlling budget revisions intended to adjust budgets to coincide with the actual rate of spending.

9. Provide for automatically grouping object code accounting data by budget classifications.

10. Provide for audit trail reports of accounting and budgetary transactions to supply persons accountable for results with a basis for analyzing variances.

Auxiliary Services Reporting

11. Provide for preparation of revenue and expenditure reports which summarize actual vs. budget amounts and variances on a current month and year-to-date basis.

12. Provide for accumulating and reporting of performance measure and analytical data such as:

a. Revenues and costs per student.

b. Gross margins.

c. Inventory turnover.

d. Maintenance cost per square foot.

e. Other.

13. Provide for proper matching of revenue and expenditure amounts by maintaining the accounting records on the accrual basis.

14. Provide for distributing the reports to the individuals who are held accountable for each auxiliary operation.

15. Provide other appropriate organizational reporting features.

Grant/Project Reporting

16. Provide for monthly reports to account for each:

a. Federal and state grant.

b. Grants from a nongovernment organization, foundation, etc.

17. Provide for other project reports as required.

18. Provide for reporting of actual and encumbered vs. budgeted amounts on an inception-to-date basis as well as reporting current month and year-to-date information to the responsible individuals.

19. Provide for using the same data as utilized to prepare the financial statements to prepare the reports.

20. Provide for reporting grant data in line with the grantor's requirements vs. Oakland University budget line items and for variable sequencing and subtotals to meet third-party reporting requirements.

21. Provide for allocating and posting indirect costs to grant accounts.

22. Provide for carrying forward balances from one fiscal period to another and for maintaining expenditure history on an inception-to-date basis. Also provide for fiscal years independent of the university's fiscal year.

23. Provide for encumbering and liquidating salaries for grant accounts.

24. Provide for maintaining grant/project descriptive data in the system, including:

a. Grant/project name.

b. Principal investigator.

c. Termination date.

d. Funding source.

25. Provide for maintaining accounts receivable trial balances for grant accounts.

26. Provide for preparing budgets independent of the university budget.

Budget Preparation and Review

27. Provide for developing revenue and expenditure budgets at the lowest organization/program expenditure level.

28. Provide for summarizing budget amounts on a functional and program basis.

29. Provide for preparation of monthly budgets with three development options:

a. Annual amount allocated equally by month.

b. Annual amount allocated by payroll cycle.

c. Budget specific amounts in specific months.

30. Provide for four cycles to be tracked during the budget preparation process:

a. Estimated for the current year.

b. Requested for next year.

c. Recommended for next year.

d. Approved for next year.

31. Provide for mechanical summarization and roll-up of budget amounts on a timely basis. Also provide for ease in recasting budget amounts;

multiple budget iterations in each cycle.

32. Provide for budget development reports which include last year's actual and current year budget amounts.

33. Provide for flexibility to accommodate cost allocations and formula budgeting.

34. Provide for flexibility to accommodate budget revisions throughout the year.

35. Provide for capability for selectively preparing budget development reports for specific organizational units, etc.

36. Provide audit trails for budget changes.

Fund General Ledger Accounting

37. Provide for a meaningful and descriptive account coding structure which:

a. Minimizes the size of the input coding block.

b. Accommodates internal and external reporting requirements.

c. Accommodates changing relationships during the year.

38. Provide for top level financial, government (including HEGIS reporting), organization/program, and grant/project reporting.

39. Provide for automatic posting and balancing of subsidiary ledger amounts to general ledger accounts.

40. Provide for processing of activity for two accounting periods on a continuing basis.

41. Provide for tracking expenditures of designated and restricted gifts.

42. Provide for preparation of one-time, nonrecurring reports on an as-required basis.

Purchasing and Disbursements

43. Provide for encumbering amounts from requisitions and/or purchase orders and for processing partial liquidations.

44. Provide for rejecting requisitions/purchase orders if an over-draft situation is to occur.

45. Provide for timely posting of encumberance and accounting transactions to maintain account balances on a current basis.

46. Provide for obtaining account balance information on a timely basis for use in approving expenditure commitments.

47. Provide for timely and effective receiving and voucher audit procedures.

48. Provide for use of check request forms for payment of one-time vendors and for accumulation of summary history on these payments.

49. Provide for monitoring the activity of vendors on the vendor master file and for maintaining only active vendors on the file.

50. Provide for forecasting cash requirements based on summarizing unpaid invoices.

51. Provide for printing checks on the system with all checks drawn on a single bank account independent of the fund to which the expense was charged.

52. Provide for billing interdepartmental services and for summarizing/reporting the charges to the respective departments.

Interfaces

1. Payroll

a. Provide payroll expense distributions by object code.

b. Provide cost study head count and other nondollar data.

2. Student Records

a. Provide revenue distribution data.

b. Provide financial aid cost distribution data.

c. Provide cost study, student/credit hour, and other nondollar data.

3. Fixed Asset Records--provide listings of equipment purchased, transferred, etc.

4. Work Order System--provide work order cost distribution and billing data.

Key Reports

Name	Purpose
Organization/Program Reporting	
*Budget Summary Reports Administrative Responsibility Level Dean/Director Responsibility Level Departmental Responsibility Level	Summarizes financial and performance measure (including auxiliary enterprises) activity along functional and program lines. Indicates overdrawn accounts and projects year-end balances to highlight possible OD's. For auxiliary enterprises, would produce statement of revenues and expenditures.
Cost Analyses of Instructional and Administrative Units	Provides monthly cost information by program or administrative unit. Monitors unusual fluctuations in per unit costs.
Auxiliary Services Reporting	
Same as Organization/Program Reporting	

Name	Purpose
Grant/Project Reports	
Grant/Project Status Report (similar to budget summaries)	Shows termination date, principal investigator, total line item budgets (in granting agencies' format), current month activity, grant-to-date totals
Grant Accounts Receivable Trial Balance	Reports the amount due from granting agencies for each individual grant (memo only). All grants for each agency are summarized and tied into accounts receivable control accounts for each major agency or corporation
Budget Preparation and Review	
*Functional Budget Summary	Provides the persons responsible for each organization unit with financial information to aid the budget development process and summarizes budget amounts
*Program Budget Summary	Provides the persons responsible for each program unit with financial information to aid the budget development process and summarizes budget amounts
Fund General Ledger Accounting	
Monthly Fund Trial Balance	Provides a detailed trial balance reporting all accounts by account number within fund
Monthly Balance Sheet	Provides a balance sheet for each fund for which financial statements are to be prepared, including current period versus prior period comparisons
Monthly Changes in Fund Balance	Summarizes the changes of the fund balance for each fund
Monthly Statement of Interfund Transfers	Itemizes transfers to and from fund balances

Name	Purpose
Analysis of Fund Revenue and Expenditures	Reports current month and year-to-date activity for each fund, including budget and variance from the plan. Activity is organized by type and source of revenue and by object of expenditure.
Chart of Accounts	Shows activity name, budget category, and department responsibility for each account number
Account and Object Code Dictionaries	Defines all internal account coding/object codes
Fund Ledger	Reports detail of monthly activity for each account, summarizes it by object code, and compares budget to actual, making year-end projection (if applicable) and reflects prior year-to-date activity for comparative purposes
Audit Trails	Provides audit trails of all accounting and budgetary transactions, including cross references to originating source documents
*Financial Statements	Provides year-end reports of revenues, expenditures, transfers, and changes in fund balances
Purchasing and Disbursements	
Open Purchase Order Listing	Shows original order, total receipts, and remaining order balance by vendor
Check Registers	Provides reference for determining if a particular invoice has been paid and is also the permanent record of checks written
Vendor Master Book	Alphabetizes all regular vendors and shows last order date and total dollar volume for current year

Name	Purpose
*Cash Requirements	Indicates total cash requirements for the period, based on unpaid invoices
Payment Check and Remittance Statement	Pays vendor
Inactive Vendors	Reports all vendors without activity for a year

*Indicates top management report.

Key Files

Name	Purpose
Account Master	Contains current account balances (budget and spending/revenues); account spending history; internal coding for various responsibility levels; expenditure class; revenue source; account name including grant information (i.e. principal investigation, funding source, termination date)
Account and Object Code Dictionary	Contains description of all internal account coding (responsibility levels, expenditures, and revenue class, etc.)
Vendor Master	Contains names and addresses for all permanent vendors. Also accumulates year-to-date dollars of orders placed and date of last order
Purchase Order File	Contains record of all outstanding encumbrance and orders completed in current month
Open Invoice File	Contains records for each document (invoice, debit memo, credit memo) submitted to the system. All transactions for an invoice remain on file until the balance is zero

Name	Purpose
Transaction Files Vouchers Payroll Stores Charges Journal Vouchers Cash Receipts	Accumulations of all posting entries for posting against the account master

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Cash Receipt	45,000	46,000	46,000	47,000	47,000
Vouchers	29,000	28,000	28,000	29,000	29,000
Purchase Orders	5,300	5,300	5,300	5,300	5,400
Journal Vouchers	4,200	4,200	4,200	4,200	4,200
University Services Charges	57,000	57,000	57,000	57,000	57,000
Account Master Additions,	5,000	3,000	3,000	3,000	3,000*
Changes, Deletes	5,000	3,000	1,000	1,000	1,000**

*Assumes current account structure.
**Assumes new account structure as recommended.

Recommendations

1. Revise the fund ledger system to permit budgeting and reporting by classification or object code.

2. Incorporate the use of a terminal and report-generator program.

3. Revise the account format to allow the assignment of meaningful account numbers that would include a code for cost center identification.

4. Provide relevant grant data (funding source, principal investigator, termination date) on the fund ledgers and other grant reports.

5. Provide flexible sequencing of reports, using various levels of internal coding.

6. Provide for daily postings of all transactions to the account master file.

Justifications

1. Use of fewer account numbers for each cost center would reduce the number of accounts assigned, thus relieving the departments of dealing with such a large number of accounts; reduce both manual and machine processing time; make assignment of additional cost centers (program level) more acceptable; and permit retrieval of detail data based on object codes.

2. Incorporation of terminals and a report writer will reduce the demand on the university's programmers and give the users greater flexibility in the use of the financial system.

3. Users and processors would be able to recognize account numbers with more ease. Such ease of recognition is important to the acceptance of any system.

4. Because of the nature of grant accounts, different information is required by both the faculty member and by the grant administration office in order to monitor the status of the grants.

5. The information and coding needed for the cost study process is currently contained in the account master, but cannot be used because the information is needed in a sequence different from that of the year-end financial statements. Flexibility in the coding of report sequences would permit us to respond to different (and changing) reporting requirements without time-consuming program changes.

6. Daily postings of all transactions will be necessary if financial data is to be on-line. This would permit retrieval of data on a more timely basis.

Accounting and Budgeting

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1a			X
1b		X	
2			X
3	X		
4			X
5			X
6		X	X
7		X	
8	X	X	
9		X	X
10		X	
11	X		X
12			X
13			X
14			X
15			X
16	X		X
17			X
18		X	X
19	X		X
20	X	X	X
21	X		X

Accounting and Budgeting

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
22		X	
23			X
24			X
25	X		X
26			X
27	X		X
28			X
29			X
30			X
31			X
32			X
33			X
34		X	X
35			X
36			X
37			X
38			X
39		X	
40		X	
41		X	

Accounting and Budgeting

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
42	X		X
43		X	X
44			X
45			X
46			X
47	X		
48			X
49		X	X
50	X		X
51		X	
52		X	X

University Administrative Systems

Payroll/Personnel

System Features

Payroll

1. Provide for processing payroll and payroll-related data, including:

a. Maintaining key payroll data such as salary/hourly rate, number of exemptions, deductions, etc.

b. Producing monthly salaried payroll.

c. Producing bi-weekly student and labor payroll.

d. Producing weekly actor payroll.

e. Reporting deduction information to outside agents (United Fund, TIAA/CREF, bargaining units, etc.).

f. Computing mass retroactive payments by bargaining units.

g. Processing time distribution cards submitted by all employees of the university.

2. Provide for payroll cost distribution, including:

a. Assigning all personnel to one or more cost-centers and reporting of payroll cost by cost center and object codes.

b. Recouping indirect (fringe) costs associated with grants.

c. Accumulating and reporting hours and dollars by employee classification and object code.

Personnel

3. Provide for maintaining and retrieving personnel statistics, including:

a. Maintenance of key personnel data such as, rank, date of hire, date in rank, department, participation in benefit programs, etc.

b. Easy retrieval of data for external reporting.

c. Reporting employee statistics for affirmative action and benefits management.

4. Provide for calculating, maintaining, and reporting sick and annual leave records.

5. Provide for reporting A-P staff to be reviewed during the period under the continuing contract system.

6. Provide for reporting faculty to be reviewed during the period under the tenure track system.

7. Provide for automatic production of seniority and tenure lists.

8. Provide for reporting employees eligible for automatic step increases.

Position Control

9. Provide for maintaining position control within the university, including:

a. Assigning a unique significant number to each position.

b. Listing key parameters associated with each authorized position, i.e., part-time or full-time, qualification standards, etc.

c. Providing timely data on hiring, transferring, performance reviews, promotion, and vacancies, etc.

d. Computing savings and available funds for salaried and hourly payrolls.

e. Computing FTE faculty.

f. Preparing a salary budget book with both salaried positions and budgeted salaries.

Miscellaneous

10. Separating the input of data between payroll and personnel.

a. Personnel department controls master file.

b. Payroll department controls transactions (time).

11. Provide for programming flexibility to allow for timely implementation of tax changes, bargaining agreements, etc.

12. Provide for adequate control over operations including:

a. Batching and editing of input.

b. Run to run controls to insure that data passed from one program to another is received in total by the second.

c. Comparing the beginning balance of the master file to the balance at the end of processing to make sure the difference is the payroll processed.

Interfaces

1. Student Records

a. Match faculty salaries with course lists for cost allocation study.

b. Monitor all students working more than 20 hours per week.

2. Student Receivables--monitor earnings of all students receiving federal grants.

3. Accounting and Budgeting--allocate payroll costs to ledger accounts and cost centers.

4. Work Orders--allocate hourly payroll costs to work orders.

Key Reports

Name	Purpose
Payroll	
Payroll Checks and Check Stubs	To pay employees

Name	Purpose
Direct-Deposit Receipt	To record amount of money which was direct-deposited in an employee's account
Check Register	To provide a control report which lists check numbers, employee names, and net amounts for each employee check
Payroll Register	To provide detailed analysis of each employee's pay check
Deduction Register	To provide a detailed audit trail for each type of deduction
Payroll Receipt List	To record signatures indicating receipt of checks
Excess Time Report	To list students working more than 20 hours per week
Work-Study Report	To monitor earnings of students employed under the work-study program
Employee Earnings Record	To provide a quarterly list of each employee's earnings, taxes withheld, other deductions, etc.
W-2 Forms	To report calendar-year earnings to employee and government tax offices
Union Remittance	To provide unions with amount of union dues withheld from pay checks
Bank Report	To provide a list of employee name, bank account number, and net amount of check to be direct-deposited to bank accounts for each bank
Listing of Group Retroactive Payments	To provide a detailed breakdown of the net amount of retroactive payment which will be made to each employee following retroactive rate adjustments
Bank Reconciliation--Checks Cleared	To provide a list of payroll checks which have cleared the bank, listing discrepencies (amount paid in disagreement with university records of check amount)

Name	Purpose
Bank Reconciliation--Checks Outstanding	To provide a list of all payroll checks which have not yet cleared the bank
941 Report	To provide social security with a list of earnings, FICA taxes, and employer contribution for each employee
Labor Distribution Journal and Work Orders	To provide a detailed audit trail of employee charges to cost centers, object codes, and work orders, including allocation of paid absences, payroll taxes, and pension costs to cost centers
Gross Pay Calculations	To provide an audit trail of all information for gross pay calculation
Personnel	
Departmental Composition: Alphabetical By Seniority By Job Family	To list all employees within a department and key data associated with them (rank, title, date in rank, date of hire, salary, etc.)
Available Leave Time Report	To report leave time (personal business, illness, vacation) used and remaining for each employee by department
Step Increase Notification	To notify Dean/Director units of step increases scheduled to go into effect in the next quarter
Employee Performance Review	To list all employees due for a performance review in a particular period
*Salary Analysis Statistics Rate by Class	To provide Employment Relations with summary data on salary rates by class (range, median, percent of increase from previous year, etc.)
EEOC Report	To provide data required for government reporting and for internal program planning

Name	Purpose
*Salary Summary by Demographics	To summarize headcount by demographics (female--white, black, latino; male--white, black, latino) within salary range, within class (A-P, C-T, etc.)
*Personnel Activity Report	To report activity levels for various personnel transactions (new hires, promotions, resignations, lay-offs, etc.)
Actuarial Report	To provide actuarial firm with information (salary, hire date, birthdate, sex) on full-time employees not participating in TIAA
Employees by Job Family	To provide benefits manager with the necessary data to submit reports to external agencies
Position Control	
Vacant Positions Report	To provide a list of all vacant positions within a division
*Position Control Summary	To provide a summary count of authorized and vacant positions for all divisions
Salary and Wages Budget Book	To provide a list of all authorized university positions identifying budgeted amounts and the person occupying each position
*Salary and Wage Savings	To report monthly salary and wage savings due to budgeted, but unfilled, positions
Miscellaneous	
Monthly Summary of Overtime	To provide Dean/Director units with information for monitoring and regulating overtime
Departmental Time Summary	To provide a detailed list of hours and dollars by employee classification and object code
Telephone Directory	To list all on-campus telephone numbers of university employees

Name	Purpose
Master File Print-Out	To list all payroll and personnel data on the master file
File Maintenance	To provide audit trails of all maintenance performed on master files
Audit Trail	To provide audit trails of all transactions entered to the system

*Indicates top management report.

Key Files

Name	Purpose
Payroll-Personnel Master	To provide a permanent record of key payroll and personnel data
Position Control File	To provide a permanent record of all authorized positions within the university
Payroll Codes File	To provide flexibility in payroll programs; new deductions, payroll calculations, etc., should be reflected in the files instead of being coded in the program

Transaction Volumes Over the Next Five Years*

Item	1976	1977	1978	1979	1980
Employment Form (nonfaculty)	200	210	220	231	242
Employment Form (faculty)	56	58	61	64	67
Employment Form (student)	850	895	940	990	1,040
Pay Checks	36,000	37,800	39,690	41,675	43,758
Payrolls Processed	117	117	117	117	117
Position Changes	4,300	4,640	4,800	5,140	5,400

*Based on the premise of a five-percent student increase.

Recommendations

1. Incorporate the payroll and personnel data into one system and file, but maintain separate data input and audit responsibilities.

2. Calculate, maintain, and report vacation and sick time information through the computer system.

3. Incorporate maintaining and reporting of positional data--vacancies, hiring, transfers, and promotions--into the system. Mechanize the salary Budget Book and provide information on savings or available salary and hourly payroll funds. Calculate faculty FTE.

4. Mechanize the computation of mass retroactive payments.

5. Incorporate a report-generator program for preparation of required nonrecurring reports.

6. Reflect payroll classifications in object codes.

7. Initiate a time reporting system to distribute payroll expenses to cost centers, object codes, and work orders. Print a turn-around time report document for entry of time distribution data on an exception basis.

8. Investigate the possibility of on-line data entry in the payroll department.

Justification

1. Personnel records are currently a stand-alone application. One person collects, maintains, and retrieves the data. There is no documentation or audit trail. Some information is maintained in both the payroll and personnel files and must be updated in both systems. Integration of these two systems would increase efficiency, control, and continuity.

2. Leave time records are manually maintained in many offices and often

disagree with the records of Employment Relations. Mechanizing the process would eliminate the duplicate bookkeeping effort and the resulting disagreements.

3. The Salary Budget Book is manually prepared with great effort, [illegible] maintenance of it is performed throughout the year. Further, FTE faculty could be calculated on the computer once positional data is maintained.

4. Retroactive payments are currently calculated manually for each member of a bargaining unit, keypunched, and fed into the computer. Mechanization of this operation would save time.

5. Many one-time reports are prepared, especially for external agencies; the requirements are always changing. A report-generator would provide timely information and decrease programming effort.

6. Summaries of employee classifications would be available to departments on the accounting ledgers and could be easily retrieved centrally by aggregating object codes.

7. Program/organizational unit reporting is a major need of the university. Since payroll costs represent 65 percent of the university expenses, it is essential that time be accurately allocated to appropriate cost centers, object codes, etc.

8. There is a lot of duplication of effort in entering changes to employee master. Source documents are transcribed to transmittal sheets and sent to computer center where they are keypunched. Operators are not familiar with payroll data and any errors must be corrected by payroll. Changes would be more quickly and accurately reflected if payroll/personnel employees could enter changes on-line, with reference to source documents.

Payroll/Personnel

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1a		X	
1b		X	
1c		X	
1d		X	
1e		X	
1f	X		X
1g	X		X
2a	X	X	X
2b	X		X
2c			X
3a		X	X
3b		X	X
3c	X	X	X
4	X		X
5	X		X
6	X		X
7	X		X
8			X
9a	X		X
9b	X		X
9c			X
9d	X		X

Payroll/Personnel

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
9e	X		X
9f	X		X
10a			X
10b			X
11			X
12a	X	X	
12b		X	
12c			X

University Administrative Systems

Admissions

System Features

Recruitment

1. Provide for maintenance of data to be used in the recruiting process, including:

   a. Recording key data for prospects, such as name, high school, area of interest, SAT/ACT scores, etc., to be used by admissions counselors in the follow-up process.

   b. Identifying high schools or geographic areas that supply students who tend towards certain disciplines, so that concentrated recruiting effort could be used to help meet enrollment requirements for particular programs.

   c. Summarizing recruiting results of previous semesters showing recruited vs. applied vs. accepted vs. registered by high school and geographic area, etc.

Admissions

2. Provide for processing of applicants and admitted students, including:

   a. Maintaining biographical data such as race, birthdate, geographical origin, etc.

   b. Maintaining entrance exam results and admission process status data, etc.

   c. Assigning student numbers for admitted students.

   d. Identifying candidates in need of special follow-up (financial aid, housing, re-admits, graduates, etc.).

e. Maintaining quality statistics for high schools to be used in assigning weights during recalculation of high school gradepoint averages.

f. Processing graduate student admissions.

g. Transferring candidates automatically from prospect/applicant to active student status upon being admitted.

3. Provide for identifying and reporting headcount, curriculum choice, etc., for admitted students by various groupings such as veteran, racial category, etc.

4. Provide for identifying and reporting statistics regarding full-time, part-time, graduate/undergraduate, transfers, and re-admitted students to present the picture on the "new student" population.

Performance Measurement

5. Provide for summarizing actual versus target admission results period by period for admission counselors, etc.

Miscellaneous

6. Provide for production of nonrecurring reports on an as-required basis for special interest groups, e.g., state and Federal agencies, etc.

Interfaces

1. Student Records

a. Provide lists of freshmen and transfer students by area of interest for use in assigning academic advisers and setting-up orientation meetings.

b. Provide for establishing active student master file records for each admitted student.

2. Student Receivables

a. Generate billings for advance housing and enrollment payments.

b. Provide financial aid with the names of new students desiring financial aid information.

Key Reports

Name	Purpose
Recruitment	
New Prospect Report	Provides a list of new admissions candidates added to the Prospect File
Prospect Follow-Up	Provides lists of prospects sorted in various ways, by high school, zipcode, area of interest, etc.
Nonreply	Provides a list of prospects who have not replied to contacts or correspondence
Prospect Master File List	Lists all prospects on the prospect file and associated data (address, admission counselor, area of interest, etc.)
Prospect Status	Monitors status (applied, admitted, enrolled) of all admissions candidates
High School Report (and Mailing Labels)	Provides a list of all high schools on the existing mailing list, including contact person and prior year recruitment statistics
Admissions	
Applicant Follow-Up	Provides a list of applicants requiring follow-up for additional information (housing, financial aid, handicapped, etc.)
Applicant Data Sheet	Summarizes information for each prospect who has submitted an application
Accepted, Rejected, and Withdrawn Report	Lists applicants by final disposition of their application

Name	Purpose
Deposit Report	Lists admitted students and the status of required deposits
*Admissions Standing Report	Summarizes new applicant headcount by semester and curriculum, broken down by admission decision status, sex, dorm occupancy, etc.
Profile Sheets	Prcvides information on admitted students (area of interest, transfer, etc.) for use in orientation, etc.
New Admits by Department	Informs academic areas of potential loading for introductory courses
*New Admits by Racial/Ethnic	Monitors the progress of the university in meeting its racial/ethnic goals
New Admits by Category	Provides specialized data on admitted students who fall in various categories (veteran, dorm occupant, handicapped, etc.)
Application Edit	Identifies data requested on the application, but not submitted
Performance Measurements	
*Recruiting Summaries: by high school by geographic area by admission counselor	Summarizes each semester's recruiting results showing recruited vs. applied vs. admitted vs. enrolled
Miscellaneous	
File Maintenance	Provides audit trails of all changes to the master file

*Indicates top management report.

Key Files

Name	Purpose
Prospect/Applicant File	Contains key data (name, address, area of interest, high school, admissions counselor, etc.) on prospects and information requested on applications
Active Student Master File	Contains biographical data, SAT/ACT scores, and other pertinent data on admitted and enrolled students
School File	Contains name and address, type of institution, contact person and recruiting statistics for all feeder schools (community college and four-year feeder schools)

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Undergraduate Applications	6,400	6,800	7,250	7,700	8,200
Graduate Applications	5,000	5,500	6,250	6,875	7,500
Undergraduate Update Sheets	5,500	5,775	6,060	6,360	6,660
Graduate Update Sheets	1,200	1,300	1,450	1,600	1,750
Tuition Deposit and Advance Housing Payment	1,500	1,575	1,650	1,730	1,810

Recommendations

1. Develop a recruiting module designed for follow-up on prospects and to summarize where the students are coming from (type of institution, high school name, geographic area, etc.) and what the major areas of interest are. Incorporate the graduate procedures into the recruiting module.

2. Maintain a prospect/applicant file on the computer.

3. Use the social security number as the student number.

4. Allow for processing applications even though all necessary information is not available. Produce a report which identifies the missing data.

5. Develop performance statistics regarding prospects and applicants from feeder schools.

Justifications

1. With increased competition for students, it becomes more important to develop effective recruiting strategies. Maintaining recruiting data on the computer could hasten the information flow and provide analyses not readily available with a manual system. Including the Oakland drop-out (identified in the registration/student record module) in the recruiting base could have a positive effect on enrollment.

2. Information on prospective students is currently kept with the admission counselors as they travel; computerizing the prospect file and adding application data as it is received would centralize the records, permit the production of the suggested analyses, and provide lists for required follow-up action on the part of counselors.

3. Many students have several student numbers, resulting in billing problems, etc. Using the social security number as the student number could eliminate this problem.

4. The system-recording of a student application is stopped if all required information is not present. The lists of new admits which is sent to the Dean of Freshmen is thus not complete and many students do not receive the necessary orientation literature.

Feature Status

Admissions

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1a	X		X
1b		X	X
1c		X	X
2a	X	X	
2b	X	X	
2c	X		X
2d	X		
2e			X
2f	X	X	
2g			X
3		X	X
4		X	X
5			X
6			X

University Administrative Systems

Registration and Student Records

System Features

Course/Faculty

1. Provide for maintaining course information:

a. Maintaining static course data such as credits offered, prerequisites, course description, course approval date, etc.

b. Variable course data such as time and place information, capacity, instructor, etc.

c. Historic record of when (semester and year) the course was taught.

2. Provide for production of each semester's schedule of classes.

3. Provide for identification of faculty teaching in other than their home department to be used for cost-study and other analytical purposes.

4. Provide for production of course descriptions for catalog purposes.

Registration

5. Provide for handling advance registration:

a. Recording class requests.

b. Producing section demand analysis.

c. Scheduling students in priority sequence with an automatic transfer to alternate sections of a filled class meeting at the same time.

d. Adjusting remaining section capacity to reflect advance and regular registration activity.

3. Removing advance registration requests for those students with hold cards or who did not pay required amounts.

6. Provide for handling regular registration:

a. Preparing the necessary registration documents.

b. Recording each registration on the student master file.

c. Accommodating the walk-in registrant.

d. Accommodating the student who is admitted and registers on the same day.

e. Accommodating continuing education registrants.

7. Provide for effective "hold card" procedures.

8. Provide for producing class lists which identify graduate students and those in academic trouble (students in academic trouble require a mid-semester report from the instructor).

9. Provide for identifying newly admitted students who did not register.

10. Provide for reporting semester enrollment and teaching load statistics.

Drops and Adds

11. Provide for the timely processing of drops and adds:

a. Updating the student master to reflect the current status of the student.

b. Processing mass drops (whole sections) by a single transaction.

c. Identifying financial aid students who drop courses.

d. Summarizing the reasons for drops and adds.

Grades

12. Provide for processing grades:

a. Producing turn around documents for faculty submission of grades.

b. Posting student grades to student records at the end of each semester.

c. Producing self-mailer grade reports.

d. Processing grade changes in a timely manner.

e. Calculating each student's grade point average.

f. Determining probation and other exception status such as incomplete courses, etc.

13. Provide for identifying and following up with faculty who have not submitted grades on a timely basis.

Degree Audit

14. Provide degree information, including:

a. Progress of each student towards a specified degree.

b. Effect of any changes of major.

c. Requirements for each degree program.

d. Production of student transcripts.

15. Provide for recording double majors and concentrations.

16. Provide for identifying potential graduates and confirming that they have satisfied the degree requirements for their particular program.

17. Provide for producing graduation and honors lists.

18. Provide for confirming that teaching candidates have satisfactorily met the requirements for teacher certification.

Institutional Research

19. Provide student and other statistical information for operations planning and institutional research.

20. Provide for flexible data extraction and reporting through use of a report generator.

Miscellaneous

21. Provide for identifying nongraduating/nonreturning students for follow-up survey and recruitment.

22. Provide for minimizing the amount of rebilling.

23. Provide for automatically transferring students to the alumni file upon graduation.

24. Provide adequate control over system operation, including:

a. Checking to verify that students are on the master file as the input is processed through the system.

b. Preparing edit lists to highlight error conditions.

Interfaces

1. Admissions

a. Automatic transfer of records from the prospect/applicant file to the active student master file for each admitted student.

b. Prepare lists of dropouts for re-admission follow-up.

2. Student Accounting

a. Generate student fee and billing data.

b. List inactive students for commencement of NDSL collection procedures.

3. Accounting and Budgeting--provide student, faculty, and course load statistics for trend analysis and operations planning.

4. Alumni/Development--automatic transfer of student data from the active student master to the alumni master file upon graduation.

5. Payroll/Personnel--provide information for monitoring student earnings.

6. Space Utilization--provide input for the class scheduling process.

Key Reports

Name	Purpose
Course/Faculty	
Schedule of Classes	Lists the course to be taught each semester along with associated time and place data
Course Catalog	Describes each course so that transferred courses may be easily equated to OU offerings
Course Inventory	Lists each course on the master file and the last time it was taught
Teaching Load by Instructor (for each department)	Lists each instructor and the credits delivered in total and by section
Cross Department Teaching Assignments	List faculty teaching in other than their home department (required for cost study and other analytical purposes)
Registration	
Advance Registration Class Lists	Identifies the students requesting each section
Advance Registration Schedule Summary	Summarizes the results of advance registration (students involved, completely satisfied, etc.)
Enrollment Summary	Provides a detailed breakdown on class loading (enrollment by section within curriculum, seats remaining in sections, etc., after regular registration has been completed
*Semester Enrollment Statistics	Reports official headcounts by various categories: daytime/evening, on-campus/off-campus, class within curriculum, etc.
*Course Analysis	Reports student credit hours delivered by various categories (curriculum, daytime/evening, on-campus/off-campus, etc.) and provides comparisons to previous year data for the same semester

Name	Purpose
Class List	Lists all students registered in each section, highlighting graduates and students requiring follow-up reports by instructors
Probation Follow-Up	Provides student records with a list of those students for whom midsemester reports should be submitted and identifies the instructors
No-Show Report	Provides a list of new students who were admitted but never registered
Forfeited Deposits	Provides a list of students who paid deposits but did not register
Drops and Adds	
Mass Drop	Notifies students of courses or sections in which they were enrolled, but which were dropped by the university
Drop/Add Summaries	Summarizes by curriculum the major reasons for drops and adds (time conflict, lack of interest, degree requirement, etc.)
Grades	
Grade Report	Notifies each student of his/her semester grades and cummulative grade point average
Probation Report	Lists students in academic trouble, highlighting reasons (low GPA, excessive N grades, etc.)
Faculty Grade Follow-Up Report	Identifies instructors who have not submitted grades on a timely basis
Student Grade Follow-Up Report	Lists all students with P or I grades (for all semesters) by instructor
Degree Audit	
Degree Progress	Provides an individual record of progress toward a degree, including courses needed to complete a major and to graduate

Name	Purpose
Degree Requirements	Lists requirements for each major and degree program
Change of Major Report	Lists all students who have changed majors for assignment of new academic advisers
Student Transcript	Provides a complete record of all courses taken at the university and the corresponding grades
Miscellaneous	
Student Master List	Lists all students on the master file and the key data associated with each student
Student Statistics Report	Provides lists of students in various sequences (major, adviser, minority, class, etc.)
Student Exception Reports	Provides lists of students in selected groups (dean's list, graduation candidates, incomplete, transfers, etc.)
*Student Statistics Summary	Provides student counts and credit hours in various categories (major, minority, probation, etc.) and comparisons to prior period results
Student Directory	Provides name, address, and other publishable information for student and faculty use
Student Name/Number Cross Index	Cross-indexes student name and number for easy identification
Dorm Roster	Identifies students living in the dorm
Inactive Student Report	Provides an aged list of nongraduates who have not taken classes for a year
Attrition Report	Provides a list of students who withdrew from the university
*Faculty Statistics	Provides faculty course load and grade distribution data by department, etc.

Name	Purpose
File Maintenance Reports	Provides audit trails of all maintenance performed on the master files
Audit Trail Reports	Provides audit trails of all transactions entered through the system

*Indicates top management report.

Key Files

Name	Purpose
Active Student Master File	Contains biographical and course data for all students in an active status at the university
Inactive Student Master File	Contains the same type of data as the active file except for students who are in an inactive status
Course/Section File	Provides time/place, instructor identification, credits offered, etc.
Payroll/Personnel Master File	Provides instructor name, campus address, home department, etc.
Transcript Files (active and inactive)	Contains academic history for each student
Degree Audit File	Contains course requirements and minimum GPA for each major and degree program offered by the university

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Student Record Changes	8,000	8,400	8,820	9,240	9,660
Course Section File Input	1,650	1,733	1,820	1,910	2,050
Course Request Form (A.R.)	10,000	10,500	11,025	11,580	12,150
Class Enrollment Cards	50,000	52,500	55,125	57,900	60,750
Drop/Add Forms	11,000	11,550	12,125	12,750	13,370
Mass Drop Requests	100	105	110	115	121

Recommendations

1. Identify inactive students and move their biographic and academic records to inactive files to reduce processing time. Further develop procedures that allow for student master and transcript files to be easily accessed.

2. Produce and maintain class schedules through the computer.

3. Highlight, on the class lists, probation students requiring a midsemester report from the instructor, etc.

4. Flag all drops and adds occuring after the tenth day of class so that they will be processed through the system, but not included in the reports reflecting enrollment statistics as of the tenth day.

5. Develop a degree audit module.

6. Develop quantifiable probation requirements.

7. Delay the processing of registration transactions until the student is on the student master.

8. Centralize the maintenance and processing of student records.

Justifications

1. Identification of inactive students is useful for recruitment follow-up, surveys on why students drop out, removal of folders from student records files, and for beginning NDSL billing. Without removing inactive students, the files will continue to grow and processing time will be lengthened. Currently there are 99,000 records on the student master file and with the present processing methods, it takes up to 20 minutes to locate a student's record in some cases.

2. The official schedule of classes is manually produced each semester even though the courses being taught are stored on computer files. Further,

if course activity is accumulated on the computer, the course file could be annually reviewed and outdated courses taken off the file.

3. The student records department is currently involved in a lengthy manual process at midsemester of locating and communicating with all instructors regarding probation students. Shifting the communication responsibility to the instructor, through probation identification on the class list and issuing a control listing to student records, could greatly reduce this work load.

4. From the tenth class day until the finalization of tenth-day reports, section lists are not updated to reflect actual enrollments. In addition, many students are incorrectly billed and assessed penalties during that period since drop and add transactions are held from being processed through the billing module.

5. A degree audit module would be an invaluable tool for both the advising and degree certification processes. Students could be informed quickly of the courses they need for graduation and the effects of any changes in major. Degree and teacher certification, which currently form a large part of the registrar's work load, could also be handled through the system.

6. An exception report of all students qualifying for probation is produced each semester, but must be manually reviewed to determine the valid probation candidates. Many (600-700) students are reviewed, causing the Academic Standing Reports to not come out in time to notify students who are not eligible to register. Students who should be dismissed are thus permitted to register and begin classes, especially during winter semester.

7. Many (300-400) off-campus, first-term, graduate students are admitted and register on the same day. Registration materials are then processed before

the admission documents, causing a default in tuition assessment to undergraduate, on-campus rates. Many correction entries could be avoided if registration documents are not allowed to be processed in cases where student data is not on the student master file.

8. Identical student information is maintained by numerous offices both on and off the computer. In some instances, an entire folder is copied and transported to a second location. There is no record of what records are kept. Centralizing the filing of student records would decrease the duplicate record-keeping and help assure that up-to-date information is maintained in the student folders.

Feature Status

Registration and Student Records

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1a		X	X
1b		X	
1c			X
2	X		X
3	X		X
4a		X	
4b		X	
4c		X	
4d		X	
4e		X	X
5a		X	
5b		X	
5c	X		X
5d	X		X
5e			X
6			X
7			X
8			X
9		X	
10a		X	
10b		X	
10c		X	X
10d			X
11a		X	

Feature Status

Registration and Student Records

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
11b		X	
11c		X	
11d			X
11e		X	
11f		X	X
12			X
13a	X		X
13b	X		X
13c	X		X
13d		X	
14			X
15	X		X
16	X	X	X
17	X		X
18		X	X
19			X
20			X
21			X
22			X
23a	X		
23b	X	X	

University Administrative Systems

Student Accounting

System Features

Accounts Receivable

1. Provide for recording and monitoring the status of student deposits (advance housing and tuition, lab, etc.).

2. Provide for calculating, billing, and recording tuition and housing charges, including:

a. Maintaining receivable records on an open-item basis.

b. Internally crediting student accounts to reflect financial aid awards.

c. Rebilling to reflect drops and adds.

d. Assessing special fees (Oakland Center, transportation, etc.).

3. Provide for monthly billing of current amounts and for preparation of follow-up statements for past due student accounts.

4. Provide for timely processing of refunds, including system-checking of refund eligibility for financial aid students.

5. Provide for processing both partial and full payments.

6. Provide for assessing late charges against overdue accounts.

7. Provide for notifying students of pending hold fees which will bar them from registration.

Financial Aid

8. Provide for monitoring and reporting financial aid data, including:

a. Reporting net available funds by scholarship type on an on-going basis.

b. Maintaining student aid information (parent contribution, maximum student earnings, type of award package, etc.) for each student.

c. Summarizing financial aid statistics such as number of applicants receiving awards, number of applicants using awards, etc.

d. Easy retrieval of student data required for submission of government reports.

e. Annual preparation of financial aid authorizations, with maintenance performed as needed.

9. Provide for maintaining and reporting NDSL data, including:

a. Maintaining key data such as amount of loan, repayment date, remaining balance, etc., for each loan.

b. Preparation of coupon books/payment cards and processing payments which begin one year after either graduation or the last date in attendance.

c. Preparation of late notices and delinquent status reports (overdue one month, two months, referred to collection agent, etc.).

d. Curtailment of billing during a deferment period to allow for interest accrual but no recording of principal payments that are due during the period.

e. Adjustment of accounts for teacher cancellations.

f. Removal of borrowers from the file once the loan is paid off.

10. Provide for the administration of veteran and short-term student loans.

Interfaces

1. Admissions--provide financial aid with information regarding admitted students.

2. Registration and Student Records

a. Provide data regarding registration, drop and add transactions, and special course fee assessments to initiate the billing function.

b. Provide notices of graduated and inactive NDSL students to initiate the loan repayment process.

c. Provide required data to determine if a financial aid student is eligible for a refund.

d. Process holds which may bar a student from registration.

3. Alumni/Development--provide current alumni address information for use in following-up on NDSL repayments.

4. Accounting and Budgeting

a. Provide for entering student refunds into the Accounts Payable System.

b. Provide for disbursement of Financial Aid amounts to students.

Key Reports

Name	Purpose
Accounts Receivable	
Student Financial Activity Report	Provides the assessment and payment transaction detail of either all or selected student accounts receivable
*Aged Receivable Trial Balance	Summarizes aged accounts receivable by period (current, one-month overdue, etc.)
Delinquent Accounts Receivable Balances	Summarizes delinquent receivable items, by student, on an exception basis
Revenue Distribution	Provides the transaction detail for revenue amounts summarized by budget classification/object code
Registration Holds	Lists all student holds in both department and student number sequence
Possible Cancellations	Provides the financial details for all students whose advance registration will be cancelled because required payments have not been received

Name	Purpose
Financial Aid Refunds	Provides the detail (current number of credits, etc.) required for determining the eligibility of financial aid students for refunds
Bad Check Report	Lists all students who have submitted bad checks to the university
Student Statements	Lists all current and past due receivable items and verifies payments received
*Summary Tuition Statistics	Provides a dollar breakdown of tuition and refunds by semester and by different categories of students (nonresident, graduate, off-campus, etc.) for use in developing future plans, etc.
Financial Aid	
Award Authorizations	Lists all award authorizations made to students
Awards Applied	Lists all students who registered for classes and used their awards
Awards Authorized, But Not Applied	Lists all students who were awarded aid, but never registered for classes
Financial Aid Status	Reports, by source of funds (BEOG, OU, etc.) authorized amounts, amounts applied, and remaining balances of financial aid
Student Financial Aid Data	Lists student data necessary for completion of external reports
NDSL Master List	Lists the key data (name, address, date of first payment, amount of loan principal, etc.) associated with each NDSL borrower and loan
Aged Delinquent NDSL Accounts	Summarizes delinquent NDSL accounts, by period, for mailing late notices and other collection follow-up
NDSL Deferments	Reports the circumstances and effects of NDSL deferments

Name	Purpose
NDSL Retirements	Lists NDSL recipients as loans are paid off
Audit Trails	Provides audit trail reports of all transactions entered to the system

*Indicates top management report.

Key Files

Name	Purpose
Active Student Master File	Contains name and address data as well as biographical data for each admitted student
Student Financial File	Contains records of all tuition, fee, and housing assessments and payments
Assessment Fee Control File	Contains a table of current fees
Financial Aid File	Contains records of financial aid data (family income, benefits received from outside parties, student financial contribution, etc.) and type(s) and amount(s) of awards received
NDSL File	Contains the detail of each NDSL loan (loan number, payment dates, etc.)

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Student Billings	45,000	47,250	51,000	54,000	57,000
Advance Registration Deposits	300	315	330	350	365
Tuition Payments	54,000	56,700	59,400	61,300	64,500
Financial Aid Award Cards	9,000	9,450	10,000	10,500	11,250
NDSL Billings	15,000	15,500	16,000	16,300	16,600

Transaction Volumes Over the Next Five Years (continued)

Item	1976	1977	1978	1979	1980
NDSL Late Notices	30,000	32,000	34,200	36,500	38,900
Student Financial Records (Master File)	12,000	12,600	13,250	13,900	14,600

Recommendations

1. Switch from a balance forward to an open item receivable basis and eliminate the printing of the class schedule on the student statement.

2. Internally credit student accounts to reflect all financial aid awards.

3. Maintain student financial aid data on the computer and prepare a report which lists the basic student data needed by financial aid to comply with external reporting requirements.

4. System-check the refund eligibility of financial aid students.

5. Develop a purge program for the NDSL master files.

6. Curtail the billing process of NDSL loans during a deferment period.

7. Convert to the use of coupon books or payment cards for NDSL loans.

Justifications

1. Maintaining receivables on an open item basis would provide greater detail to students.

2. The award card process is time-consuming and cumbersome for key punch operators, the financial aid accounting office, cashier's office personnel, and the financial aid students themselves. By eliminating these cards and internally crediting student accounts with financial aid awards, time would be saved and the duplicate awarding which often results with the current system could be eliminated.

3. Transferring the data on the current financial aid card files to an alternate type of storage medium will eliminate the need to transport the files back and forth to the computing center whenever a report is needed. With award information and specific student financial data on file, the workload of the financial aid office can be reduced by no longer having to manually retrieve data for external reporting, etc.

4. Under the present system, it is extremely difficult to process tuition and housing refunds to financial aid students. The amount of verifying and checking that has to be done delays some refunds over a month, makes subsequent billings inaccurate and causes bad public relations with the students.

5. Since there is no delete provision, the two master files for NDSL processing are constantly growing.

6. The occurrence of deferments for NDSL loans is increasing. There is a systematic process for handling deferments and computerizing it would improve control and decrease the work load of the financial aid accounting office.

7. Converting to coupon books for NDSL repayments would eliminate the monthly (quarterly, annual) billing of current amounts due.

Feature Status

Student Accounting

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1		X	X
2a			X
2b			X
2c		X	
2d		X	
3		X	
4	X	X	X
5		X	
6		X	
7		X	
8a		X	X
8b	X		X
8c	X		X
8d			X
8e			X
9a	X	X	
9b		X	X
9c		X	X
9d	X		X
9e			X
9f			X
10		X	X

University Administrative Systems

Alumni/Development Records

System Features

1. Provide for maintenance of key alumni data, including name, sex, address, telephone number, class, school, degrees, employer, alumni club (affiliate group), and historical giving record.

2. Provide for maintenance of nonalumni donor data, including name, sex, address, employer, giving group (President's Club, Century Club, etc.), program (Meadow Brook, Friends of Kresge Library, etc.), and historical giving record.

3. Maintain three years of detailed gift history for individuals, corporations, and foundations, including date of gift, designation of funds, and amount given. Provide for maintaining gift history for a longer term on an as-required basis.

4. Prepare donor tax receipts and incorporate a check signer in the system.

5. Provide for automatic transfer of funds to designated accounts.

6. Provide for automatic transfer of students from the student record system to the alumni file upon graduation.

7. Prepare required management reports as noted in the report section.

8. Provide for printing of form letters (thank you's, pledge reminders, etc.).

9. Provide for flexibility to accommodate future needs of the university, including such items as the ability to provide data to assist in campaign planning and control (generating target donor lists, data for follow-up of matching gift corporations, monitoring of pledges, and organization of campaigns by workers).

ALUMNI/DEVELOPMENT SPECIFICATIONS
BEGIN ON PAGE PRECEEDING TAB

Interfaces

1. Student Records--automatic transfer of key data to be maintained on the alumni files from student records upon graduation, etc.

2. Accounting and Budgeting--provide for entering of revenue accounts into the accounting system.

3. Placement--provide for periodic access to alumni records to maintain up-to-date information on active placement records.

Key Reports

Name	Purpose
Bi-Weekly Fund Drive Report	To provide data on progress of each of the respective fund drives (alumni, Meadow Brook, etc.); data for each to include number of donors and amount given, with comparative data from previous year and goals for current year
*Summary Fund Drive Report	A summary of the Bi-Weekly Fund Drive Report for management information
*Monthly Donor Report (alphabetical)	To provide management with basic data on contributions [name, address, amount, designation, date given, and giving group (alumni, Meadow Brook, etc.)]
*Quarterly Donor Report (by designation)	To provide board of trustees with basic data on contributions (name, amount, designation) with summary totals
Annual Report for Council for Financial Aid to Education	Based on data from bi-weekly fund drive reports
Fund Drive Honor Roll	To provide publicity for donors to various programs and also by giving level (President's Club, Century Club, Pioneer Club, etc.)

Name	Purpose
Gift Journal	To record detailed information on each gift received (donor, receipt number, account number, etc.)
Donor Report by Employer	To provide data for follow-up on companies with matching contribution programs
Target Donor List	To list all alumni and other donors satisfying given criteria (salary amount, occupation, contribution record-to-date, year of graduation, etc.)
Statistical Analysis Reports	To analyze giving patterns (average size of contribution, percent of return, etc.)
Mailing Labels	Fund drive mailings, brochures, etc.
Tax Receipts	To provide tax receipts for donors
Alumni Profile List	To provide a list of key information on the master file
Nonalumni Profile List	To provide a list of key information on the master file
Donor Gift History	To provide a gift history, by donor, with detailed records of the current and previous two years activity and summary data for prior years.
Outstanding Pledges (Future)	To list all outstanding pledges, including amount paid, owed, and payments missed
Pledge Reminders (Future)	To inform donors of their pledge status
Campaign Director Report (Future)	To report on solicitor's progress during fund drives
File Maintenance	To provide a record of all maintenance done to master files
Designated Gift Report	To provide an audit trail of all gifts designated for a particular use

Name	Purpose
Alumni Employment	To provide the placement office with information needed for their studies (employer, salary, etc.)

*Indicates top management report.

Key Files

Name	Purpose
Alumni Master File	Maintain biographical and historical data on alumni, including summary contribution record
Nonalumni Master File	Maintain biographical and historical data on nonalumni donors, including summary contribution record
Current Gift File	Maintain detailed giving records by individual for current year and two previous years; includes all private giving to the university, including alumni and nonalumni individuals, corporations, and private foundations

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Alumni master file (graduation list to be added each term)	11,890	13,870	15,950	18,140	20,440
Gift (gift and grant form currently) and tax receipts (currently about 2,500 annually)	2,950	3,500	4,200	5,050	6,100
Alumni address changes	2,500	3,000	3,500	4,000	4,500
Address changes and additions to nonalumni master file	[total roster has not been tabulated]				
Update alumni and nonalumni master at the end of giving year	same as receipt of gift totals				

Recommendations

1. Computerize gift records.

2. Expand the alumni master to include historical giving record (date of last gift, year-to-date contribution, etc.) as well as biographical data. Develop an expandable coding method for data on file.

3. Create a nonalumni master record system for historical giving records.

4. Include gift recording and tax receipts in the computer system.

5. Provide for flexibility to accommodate features which may be needed in future systems.

Justifications

1. All donor records are currently kept manually. There is a large amount of duplication of information (the same information is kept in an office file, as is recorded on a gift and grant form, as is noted on the tax receipt), as well as a large amount of duplication in record-keeping (the five copies of the gift and grant form now reside in five different locations). The clerical effort expended, the excess paper flow, and the multiple files could all be substantially reduced by developing the new system.

2. The current alumni records system will need to be revised by the end of 1976 if the new system is not developed. The current system is useful only for preparing address lists because there is a single code to accommodate all nonaddress information, such as class year, degree held, etc., and all available codes will be utilized by the end of 1976.

3. Better management data would be available through this system.

4. The processing and mailing of tax receipts would be expedited.

5. Each year a system change is delayed, the more complicated the situation becomes. With alumni records, for instance, there will be 30,000 alumni and 7,500 donors by 1985. It is much easier to convert the system when there are 10,000 alumni and 1,000 donors.

Alumni/Development Records

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1	X[1]	X	X
2	X[2]		X
3	X		X
4	X		X
5	X		X
6	X		X
7	X[3]		X
8			X
9			X

[1]Part of the alumni data is on the computer now, most is kept manually.

[2]This information is now scattered among several offices.

[3]Most of the reports are not generated now. Those that are done are manually prepared.

University Administrative Systems

Fixed Assets

System Features

1. Provide for physical control of fixed assets, by:

a. Maintaining key data such as purchasing and vendor information, tag number, location, etc., on appropriate property and equipment.

b. Using property tags where required.

c. Recording transfers from one location to another.

d. Updating property records through the use of physical inventory sheets.

2. Provide for accounting control of fixed assets by:

a. Recording all transfers, retirements, and cost adjustments to assets.

b. Accumulating significant annual and cummulative repair and maintenance costs by asset.

3. Provide insurance data for all units of property by:

a. Maintaining key insurance data such as insurance coverage, original and replacement costs, etc., on the property master file.

b. Establishing insurable values.

c. Supporting proof of loss claims.

4. Provide for a permanent audit trail of all activity on the property master file.

Interfaces

1. Accounting and Budgeting--record fixed asset activity for updating general ledger accounts.

2. Work Order--provide necessary data to update repair and maintenance history for property items.

Key Reports

Name	Purpose
Property Master List	Lists all data found on the property master file
Physical Inventory Worksheet by Location	Assists in the taking of the physical inventory by providing locational and descriptive data as well as allowing space to record counts on this "turn-around" document
Property List by Department	Provides departments with location and description of all property assigned to the department
Cost Summary	Provides a summary of fixed asset cost balances including opening balances, period activity and closing balances on a current month and year-to-date basis for each general ledger account
Period Activity Supporting Schedules	Provides detailed support of additions, transfers, retirements, and adjustments on a current month and year-to-date basis
Insurable Values Summary	Provides an annual update of insurable values
Audit Trail Reports	Provides audit trails for all transactions entered through the system

Key Files

Name	Purpose
Property Master File	Contains key data on property and equipment (vendor information, tag number, location)

Name	Purpose
General Ledger Transaction	Contains all data necessary to update the general ledger with property transactions

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Property Records	3,000	3,050	3,100	3,150	3,200

Recommendations

1. Develop file maintenance programs.

2. Take a physical inventory in each department to determine the current location of all fixed assets.

3. Increase the required value of inventoriable items to $100.

Justifications

1. There is currently no file maintenance program in the property control system. A record must be deleted and entered if any field on it is to be changed. Developing maintenance programs would decrease file maintenance time.

2. There was no validation of the equipment assumed to be in the various departments at the time of the conversion to the system. Consequently, the equipment data by department may not be accurate.

3. With the climbing rate of inflation, a value of $25 no longer seems significant enough to designate equipment as a fixed asset. Raising the value criteria to $100 would decrease the number of items in the equipment category.

Fixed Assets

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1a		X	X
1b	X		
1c		X	
1d			X
2a		X	X
2b			X
3a			X
3b	X		
3c	X		X
4		X	X

University Administrative Systems

Space Utilization

System Features

1. Provide for reporting on classroom, office, and other space utilization.

2. Provide for maintaining classroom availability on a class hour basis for classroom scheduling.

3. Provide for maintaining the square footage of each university building.

Interfaces

1. Registration and Student Records--provide scheduling data by listing the classrooms available at any given hour.

2. Work Order--provide data to allocate building, cleaning and maintenance costs per square foot as required.

Key Reports

Name	Purpose
Space Utilization	Provides statistics on office and classroom utilization
Classroom Scheduling	Provides a listing of classroom capacity and class hour availability
Square Footage	Reports the square footage of each university building

Key Files

Name	Purpose
Space Utilization	Contains key building and classroom statistics

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Master File Records	1,500	1,500	1,500	1,600	1,600

Recommendations

1. Demechanize the space utilization system.

Justifications

1. The current space utilization system is useful only to print the contents of the master file, which is minimal. The need for an annual report on space utilization does not currently justify maintaining elaborate computerized records. The information could be effectively kept on cards in the short run.

Space Utilization

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1	X	X	X
2			X
3		X	X

University Administrative Systems

Stores Inventory

System Features

1. Provide for maintaining physical control over low value items within the stores inventory.

2. Provide for maintaining both accounting and physical control over high value items.

3. Provide for timely posting of stores charges to general ledger accounts.

Interfaces

1. Accounting and Budgeting--provide billing data for stores charges to be posted to the appropriate accounts.

Key Reports

Name	Purpose
Stock Status Ledger Cards	Lists all high value inventory items and corresponding stock status, minimum level, activity, etc.

Key Files

Name	Purpose
Inventory Master Ledger Cards	Contains all pertinent stores inventory data

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Inventory Items	400	410	425	425	450

Recommendations

1. Demechanize the stores inventory system in the short run.

2. Generate more frequent postings to the accounting system.

3. Initiate a selective control inventory system in which detailed inventory records are kept only for high value items. Physical control is maintained over items with a low unit value and they are expensed when purchased.

Justifications

1. Inventory records are currently maintained on both the computer and ledger cards and all ordering is done through examination of the cards. The low total dollar amount of the higher value inventory items does not necessitate maintaining both systems and the computer interface could be eliminated.

2. Stores charges for one month are not due in the computer center until two days into the next month, causing charges to be at least a month behind. More frequent postings would provide more timely billing.

Stores Inventory

Feature Status

Feature Number	Currently Manual	Currently Computer	Additional Required Feature
1		X	X
2		X	X
3			X

University Administrative Systems

Work Orders

System Features

1. Provide for estimating labor and materials on major work orders, by:

   a. Developing formal written estimating procedures.

   b. Estimating emergency work orders after the immediate problem is solved.

   c. Estimating annual work orders on a monthly basis to account for seasonality and other fluctuations of the work.

2. Provide for evaluating productivity and performance by monitoring actual labor and material charges against estimated or budgeted amounts for work orders and cost centers.

3. Provide for prioritizing work orders.

   a. Emergency.

   b. Jobs which could become an emergency if not completed within two to three days.

   c. Work to be accomplished within a given service level.

4. Provide for system-listing of all major cleaning and maintenance due to be performed during the month.

5. Provide for scheduling work and monitoring of work order status, by:

   a. Monitoring backlogs.

   b. Coordinating activities between trades.

   c. Notifying requestor department of work order status.

Interfaces

1. Accounting and Budgeting--provide for distributing cost and capital expenditure amounts to appropriate accounts.

2. Fixed Assets--provide for updating maintenance cost history for major property items.

Key Reports

Name	Purpose
Work Order Performance Report	Provides a comparison of actual vs. estimated hours and dollars for completed work orders
Work Order Backlog Report	Provides a listing of open work orders in promised completion date order to be used for scheduling purposes
Requestor Status Report	Reports work order status to requesting departments, showing total amounts estimated, spent, and billed
Cleaning and Maintenance Summary	Lists the frequency of all cleaning and routine maintenance to be performed during the month

Key Files

Name	Purpose
Open Work Order File	Records key work order data such as priority, date received, cost estimates, etc.
Work Order Transaction File	Contains data required to update fixed assets and accounting records

Transaction Volumes Over the Next Five Years

Item	1976	1977	1978	1979	1980
Work Order	2,100	2,200	2,300	2,400	2,500

Recommendations

1. Initiate a mechanized work order control system.

2. Mechanize the billing process for work orders.

Justifications

1. There is no work control department within Plant Maintenance. All scheduling is done manually, as is work order status monitoring. Mechanizing the work orders would provide reports which aid in scheduling, point out cleaning and maintenance which is due, and highlight work order cost performance.

2. Billing work orders is currently a manual process involving sending a journal voucher to accounting and notifying the requesting department at a later date. Mechanized billing would flow easily from computer maintenance of work order status and requestor departments could be notified on a timely basis of the amounts billed for each work order.

Work Orders

Feature Status

Feature Number	Currently Manual	Currently Computer	Additonal Required Feature
1a	X		X
1b	X		X
1c	X		X
2	X		X
3	X		X
4			X
5a	X		X
5b	X		X
5c	X		X